Attachment 2
Summary of Technical and Scientific Issues

The statute mandate for external scientific peer review (Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine "**whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods and practices**".

We request that you make this determination for each of the following issues that constitute the scientific portion of the proposed regulatory action. An explanatory statement is provided for each issue to focus the review.

1. **The derivation of a linkage between methylmercury in water, largemouth bass and trophic level 4 fish.**

Central Valley Water Board staff used the relationships between length and methylmercury tissue concentration of largemouth bass samples collected in September/October 2000 at multiple Delta locations to estimate methylmercury concentrations in largemouth bass of a standard size (350 mm). Staff described the linkage between methylmercury in Delta water and fish using the regression between the average methylmercury concentration of water sampled between March and October 2000 and the standard 350 mm largemouth bass. The March-October 2000 water data were pooled by Delta subregion to calculate monthly averages. Monthly averages were used to ensure that the March-October 2000 average was not biased by months with different sample sizes. The year 2000 largemouth bass data were used in the linkage analysis because the exposure period of these fish had the greatest overlap with the available water data; monthly water data were collected during the last eight months of the life of the fish.

The regression analysis showed that average concentrations of methylmercury in biota correlate significantly with unfiltered, aqueous methylmercury. This approach is similar to using site-specific bioaccumulation factors (BAF; ratio between methylmercury in fish to water). This analysis is more robust than simple BAFs because there were multiple collection sites within the Delta with varying concentrations of methylmercury in fish.

Staff used the relationship between methylmercury in 150-500 mm TL4 non-migratory fish sampled between 1998 and 2001 and the standard 350 mm largemouth bass to express the proposed TL3 fish tissue objective (0.08 mg/kg) in terms of 350 mm largemouth bass. The resulting largemouth bass "implementation goal" (0.24 mg/kg) was substituted in the water/bass regression equation to determine a corresponding safe level of methylmercury in water (0.066 ng/l). Staff recommends an implementation goal for methylmercury in water of 0.06 ng/l, which incorporates a margin of safety of approximately 18% (margin is greater for some piscivorous wildlife species).

2. Analysis of annual total mercury and suspended sediment loads and conclusions drawn from the analysis.

Water, methylmercury, total mercury and suspended sediment budgets were prepared for the Delta. In addition, water, total mercury and suspended sediment balances were prepared for the Sacramento Basin. For most tributary sources, statistically significant relationships exist between flow and total mercury concentration and/or flow and suspended sediment concentration. For these sources, regression equations were used to predict concentrations that correspond to daily flow volumes. Annual loads were calculated by multiplying the average daily flow by the predicted daily concentration and summing over the year. To estimate annual loads for sources that did not have statistically significant relationships between flow and concentration, the average of available concentration data was multiplied by the annual discharge.

Staff is in the process of calculating the 95% confidence intervals for the total mercury and suspended sediment load estimates and for the Delta and Sacramento Basin mass budgets. The confidence intervals will allow staff to determine whether the Delta and Sacramento Basin total mercury and sediment budgets "balance" (i.e., whether there is a statistically significant difference between the inputs and exports). Staff expects to provide the confidence interval calculations and conclusions drawn from them to the peer reviewers in an addendum by 21 July 2006. The confidence interval information that will be revised is in Sections 7.1.1, 7.2, 7.3, and Appendix J of the TMDL Report.

3. Effectiveness of proposed implementation actions in achieving the desired reductions in methylmercury in ambient water and fish tissue.

Methylmercury production is affected by multiple factors, including concentrations of available mercury in sediment, sulfate, nutrients, pH of overlying water, and degree of anoxia. The proposed implementation plan addresses factors that affect methylation. One example is the proposed requirement that new water impoundments or wetlands projects produce no net increases in methylmercury loads. In addition, the proposed implementation plan recommends reducing total mercury loads entering the Delta, which is expected to result in decreases of methylmercury production. Also during implementation, Staff will incorporate new information about controlling methylation and demethylation in the Delta and its tributary watersheds.

4. Overarching questions.

Reviewers are not limited to addressing only the specific issues presented above. Additionally, we invite you to contemplate the following "big picture" questions.

(a) In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific portion of the proposed rule not described above? If so, please make the determination defined above from the statute language.

(b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed Regional Board action. At the same time, reviewers also should recognize that we have a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, we encourage you to focus your feedback on the scientific issues that are relevant to the central regulatory elements being proposed.